

South County Traffic Relief Initial Screening Executive Summary

This is a screening-level document-based on an initial congestion relief analysis. Over the next stages additional studies will be conducted as part of the Caltrans Project Study Report Phase and during the Project Report and Environmental Phase. The purpose of this document is to provide an initial screening and evaluation of the 20 transportation improvement ideas submitted by the public. The ideas have been evaluated based on their potential ability to provide substantial traffic relief improvements in south Orange County.

The 20 transportation ideas were suggested by the public during three “Get Moving OC” transportation forums. Due to the wide spectrum of improvements, the ideas were sorted into four categories:

Category 1: Ideas that are already being advanced or implemented by agencies other than TCA

Category 2: Ideas that are ineffective or are premature

Category 3: Ideas that are not feasible due to regulatory or financial constraints

Category 4: Remaining ideas subjected to mobility analysis

Based upon preliminary data, there are **7 ideas that are recommended for further** study in the Project Study Report (PSR):

Idea 9: Connect Ortega Highway and Antonio Park way to Avery Parkway and SR-73

Idea 11: Add I-5 General-Purpose Lanes from I-405 to County Line

Idea 12: Add I-5 HOT Lanes from I-405 to County Line

Idea 13: Connect SR-241 to I-5 via the Western Alignment

Idea 14: Connect SR-241 to I-5 via La Pata Avenue Crossing

Idea 17: Connect SR-241 to I-5 via Shore Cliffs

Idea 18: Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241

The graphic below shows the relationship between this initial screening and the Caltrans Project Development Process. As depicted in the graphic some work in the Project Study Report Phase has been underway focused on data gathering and documentation of existing conditions.



The subsequent phases referenced in the graphic, will provide further opportunities for public participation and input regarding regional mobility, north/south traffic congestion relief, and alternative evacuation routes for public safety emergencies including natural disasters such as fires, floods, earthquakes or national emergencies.

The **Project Study Report (PSR)** will provide an evaluation of each of the 7 alternatives and include recommendations for a set of alternatives to be advanced into the Project Report/Environmental Document phase.

The **Project Report/Environmental Document Phase (PR/ED)** will commence with a Public Scoping meeting/Scoping period that allows for additional or modified ideas/alternatives to be suggested for consideration. This phase will include additional studies and evaluation of each alternative, and will lead to recommendation of a Preferred Alternative. The graphic on the following page “Exhibit 3” shows the results of this initial screening with all 20 transportation improvement ideas shown by category.

Category 1 - Already Being Advanced or Implemented

- Idea 6.** Widen Ortega Highway to Four Lanes in San Juan Capistrano
- Idea 8.** Extend La Pata Ave to Cristianitos Road
- Idea 10.** Add I-5 HOV Lanes from Avenida Pico to County Line

Category 2 - Ineffective or Premature



- Idea 1.** Dynamic Pricing of TCA Facilities
- Idea 16.** Assume 20% of Vehicle Fleet is Automated

Category 3 - Infeasible due to Regulatory or Financial Constraints

- Idea 2.** Greater Train Frequency
- Idea 15.** Connect SR-241 to I-5 via Cristianitos Road
- Idea 19.** Connect SR-241 to I-15 in Temecula
- Idea 20.** Double Decking I-5

Category 4 - Mobility Benefits/Further Study Needed

- Idea 3.** Synchronized Lights on Arterials
- Idea 4.** Add Mobility Hubs at Train Stations and other Key Locations
- Idea 5.** Build Out of OCTA District 5 Bike Facilities
- Idea 7.** Complete Arterials to MPAH Maximum
- Idea 9.** Connect Ortega Highway and Antonio Parkway to Avery Parkway and SR 73
- Idea 11.** Add I-5 General Purpose Lanes from I-405 to County Line
- Idea 12.** Add I-5 HOT Lanes from I-405 to County Line
- Idea 13.** Connect SR-241 to I-5 via Western Alignment (La Novia Avenue)
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- Idea 17.** Connect SR-241 to I-5 via Shore Cliffs (Avenida Vacquero)
- Idea 18.** Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241

-  - TCA offer assistance to local jurisdictions
-  - Ideas advanced to PSR/PDS phase

**SOUTH COUNTY TRAFFIC RELIEF
INITIAL SCREENING**

ORANGE COUNTY, CALIFORNIA

LSA

FEHR & PEERS

December 2017

SOUTH COUNTY TRAFFIC RELIEF INITIAL SCREENING

ORANGE COUNTY, CALIFORNIA

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Project No. TCA1101, Task 18

The logo for LSA, consisting of the letters 'LSA' in a bold, blue, sans-serif font.The logo for Fehr & Peers, featuring the words 'FEHR' and 'PEERS' in a black, serif font, separated by a stylized green graphic element resembling a leaf or a stylized ampersand.

December 2017

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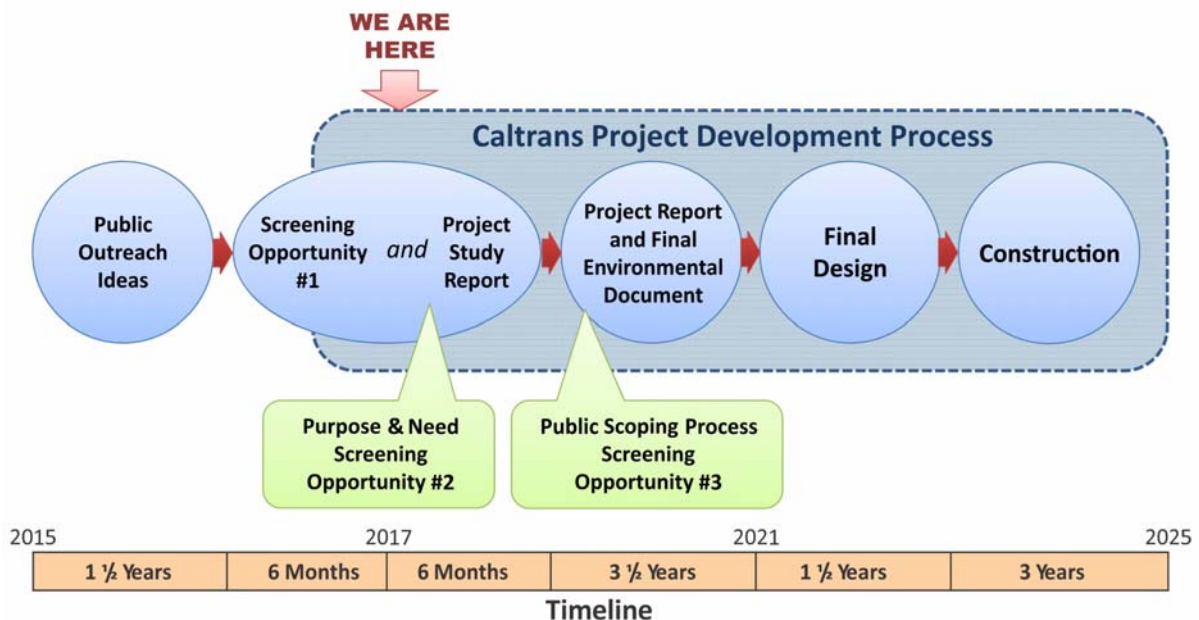
Caltrans	California Department of Transportation
County	Orange County
HOT	high-occupancy toll
HOV	high-occupancy vehicle
I-405	Interstate 405
I-5	Interstate 5
MPAH	Master Plan of Arterial Highways
OCTA	Orange County Transportation Authority
OCTAM	Orange County Transportation Analysis Model
PSR/PDS	Project Study Report/Project Development Support
SCTRIIS	South County Traffic Relief Initial Screening
SOCMWG	South Orange County Mobility Working Group
SR-73	State Route 73
SR-133	State Route 133
SR-241	State Route 241
TCA	Transportation Corridor Agencies
VHD	vehicle hours of delay
VMT	vehicle miles traveled

1.0 INTRODUCTION

The purpose of this South County Traffic Relief Initial Screening (SCTRIS) is to document the initial evaluation of numerous transportation improvement ideas based on their potential ability to provide substantial traffic relief improvements in south Orange County (generally south of Interstate 405 (I-405))(Study Area). While many of the suggested improvements improve mobility in the Study Area, they do not provide substantial improvement. Therefore, this initial screening has been prepared to provide a basis to sort and categorize the improvement ideas that have the potential to achieve substantial benefits, and at the same time identify mobility improvements that could be initiated by other public agencies. This document also notes mobility improvements suggested by the public that are under the purview of other regional transportation agencies.

Starting in January 2016, the Transportation Corridor Agencies (TCA) commenced implementation of a comprehensive community involvement plan to engage elected officials, the Orange County Transportation Authority (OCTA), the California Department of Transportation (Caltrans), business groups, and other interested parties in an effort to identify traffic congestion relief ideas to improve north-south mobility within the Study Area. Between June 2016 and June 2017, three public forums were held to identify traffic congestion relief ideas and to describe the process for development of project alternatives that could provide the needed north-south traffic congestion relief.

The graphic below shows the relationship between the initial screening and the Caltrans Project Development Process. Subsequent to the initial screening, transportation ideas will be evaluated to determine whether they meet Purpose and Need and if they are feasible based on the severity of environmental impacts as well as engineering feasibility, during the Project Study Report (PSR) phase. As depicted in the graphic some work in the PSR phase has been underway focused on data gathering and documentation of existing conditions. Ideas that are screened out in the PSR will not be evaluated in further detail in the environmental document. After public review of the environmental document, the Project Development Team will select a Preferred Alternative, subject to Caltrans approval of the project.



2.0 BACKGROUND

This SCTRIS was prepared to document the initial evaluation of numerous transportation ideas to improve mobility in south Orange County that were identified through public outreach and stakeholder engagement. The mobility problem is described as:

- Excessive northbound and southbound Interstate 5 (I-5) congestion during the morning and evening peak weekday transportation hours, on weekends and whenever there is a collision or other incident that impacts I-5 traffic lanes.
- Difficulty using local arterial streets for accessing and crossing the I-5 (passing over or under) during peak transportation times and periods when there are collisions or other incidents.

TCA implemented a comprehensive community involvement plan with elected officials, business groups, and the general public between January 2016 and June 2017. In addition, the South Orange County Mobility Working Group (SOCMWG), which is made up of south Orange County elected officials who hold a seat on a regional transportation board, was formed and met seven times. SOCMWG defined the mobility problem as follows.

A regional transportation mobility problem exists that:

- *Is most easily seen in I-5 congestion;*
- *Is intermittent;*
- *Is seen in excessive northbound/southbound I-5 congestion weekday a.m. and p.m. peak hours, weekends, or when there is an incident on I-5;*
- *Creates difficulty using local arterials;*
- *Creates safety concerns;*
- *Lacks meaningful transit options as a potential solution; and*
- *Is getting worse with more development*

TCA held three forums to understand the south Orange County communities' priorities as well as receive input regarding regional mobility. The first public forum was held in June 2016. Formal presentations at the forum provided context regarding local, regional, and statewide transportation issues, as well as factors contributing to traffic congestion issues in south Orange County. The public was then asked to identify transportation solutions to address this growing problem. Input from the public and elected officials generated 15 of the ideas evaluated in this initial screening to improve mobility throughout south Orange County and the region. This forum was attended by more than 100 members of the public and online by more than 100 individuals.

The second public forum was held in October 2016. At the forum, more than 200 members of the community reviewed the 15 different transportation ideas, along with both the anticipated benefits and challenges of each of these transportation ideas based on a cursory and preliminary analysis conducted by transportation planners. The public was also provided with a transportation index highlighting how those ideas would negatively or positively affect traffic flow. More than 100 individuals attended online.

The third public forum was held in June 2017. At that forum, more than 600 members of the community attended in person and more than 3,000 people viewed a live stream of the event online. Attendees were provided presentations by transportation agencies (Caltrans, TCA, and OCTA) outlining a process to consider mobility ideas and fully evaluate the ideas through a rigorous technical and environmental process.

As a result of the third public forum and subsequent input, additional ideas were suggested, for a current total of 20 ideas.

3.0 DESCRIPTION OF IDEAS

The initial set of congestion relief ideas was generated from public outreach efforts with stakeholders and elected officials in the Study Area (from the I-405/I-5 interchange to the San Diego County line). The 20 ideas being considered in this initial screening are described below and are shown in Exhibit 1 (Ideas 2, 4, 6, and 8–20) and Exhibit 2 (Ideas 3, 5, and 7).

3.1 IDEA 1: DYNAMIC PRICING OF TCA FACILITIES

This idea proposes setting the toll on TCA facilities at a certain level depending on congestion (i.e., a higher toll would be set during peak periods). Idea 1 is not represented in the exhibits.

3.2 IDEA 2: GREATER TRAIN FREQUENCY

To increase train frequency, it is necessary to construct a second railway track, running from south of the Orange County/San Diego County line to Camino Las Ramblas in Dana Point. North and south of these points, there is an existing double track. Idea 2 would essentially close the double track gap in south Orange County, as shown on Exhibit 1.

3.3 IDEA 3: SYNCHRONIZED LIGHTS ON ARTERIALS

Idea 3 proposes synchronization of traffic lights on arterial highways in south Orange County, as shown on Exhibit 2, to improve mobility during peak periods. Many of these arterials are already synchronized, but require periodic updates.

3.4 IDEA 4: ADD MOBILITY HUBS AT TRAIN STATIONS AND OTHER KEY LOCATIONS

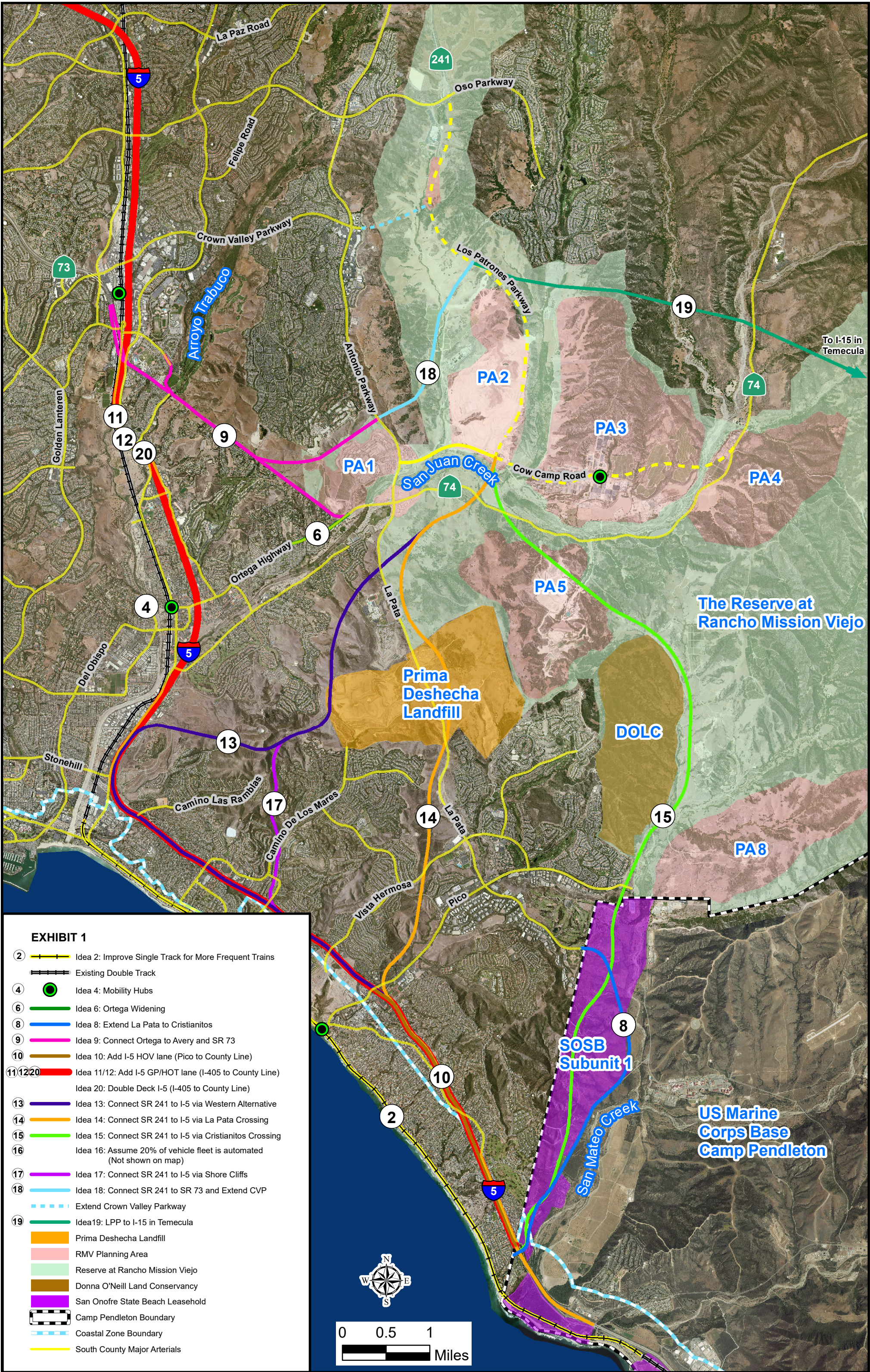
This idea would add mobility hubs, which could include on-demand shuttle services, bicycle parking, pedestrian improvements, electric vehicle charging stations, and mixed-use development, at the existing San Clemente Metrolink Station, San Juan Capistrano Metrolink Station, and Laguna Niguel/Mission Viejo Metrolink Station, and at a new location on Cow Camp Road in Rancho Mission Viejo. Exhibit 1 shows the locations of these mobility hubs.

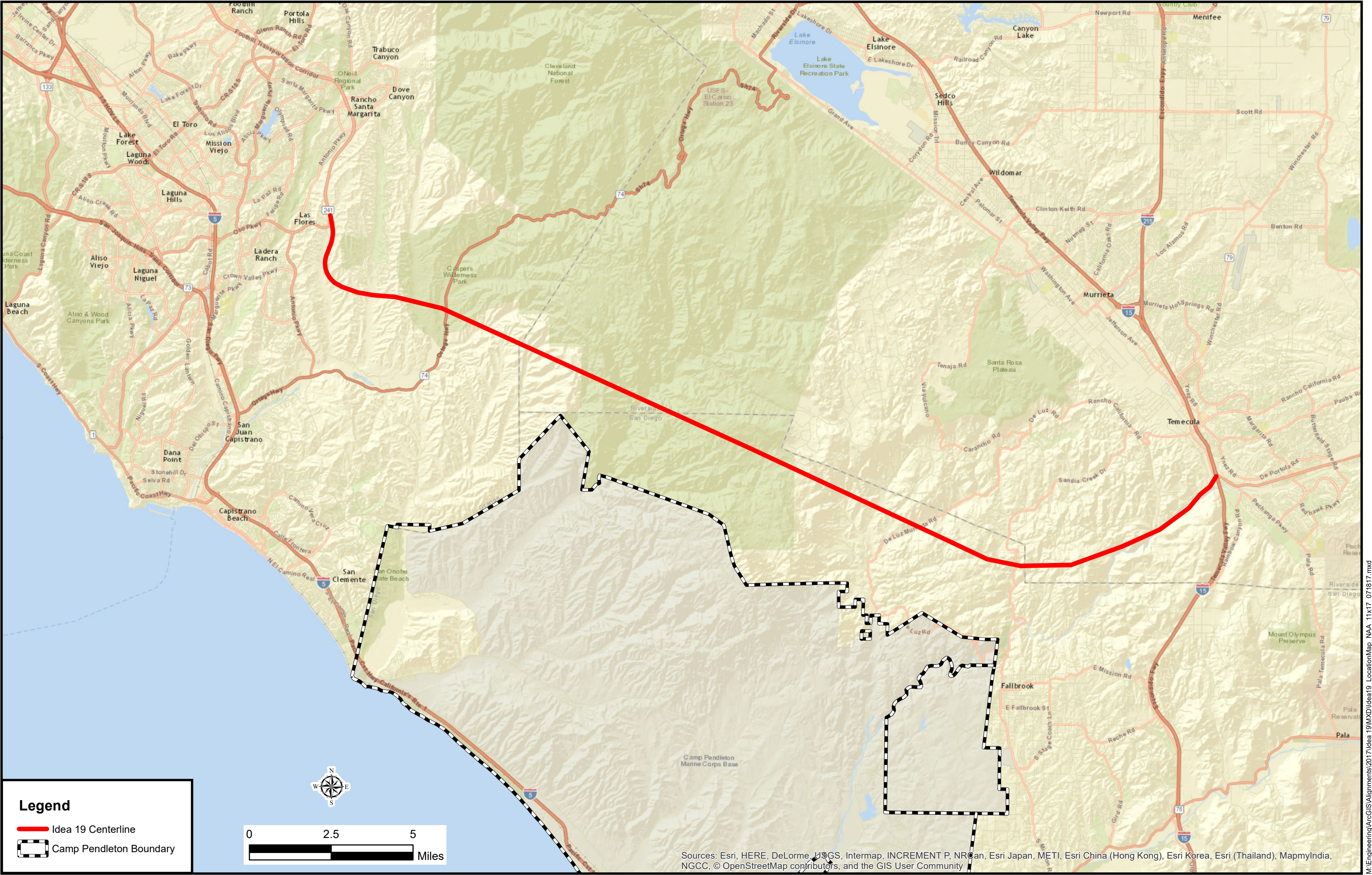
3.5 IDEA 5: BUILD OUT OF OCTA DISTRICT 5 BIKE FACILITIES

Idea 5 proposes the build out of Orange County District 5 (Aliso Viejo, Dana Point, [portions of] Irvine, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano) bike facilities in OCTA's Commuter Bikeways Strategic Plan (Exhibit 2). This idea also includes legislation to support Neighborhood Electric Vehicles usage of bicycle lanes and mobility hubs to include electric bicycles.

3.6 IDEA 6: WIDEN ORTEGA HIGHWAY TO FOUR LANES IN SAN JUAN CAPISTRANO

This idea proposes widening Ortega Highway from two lanes to four lanes in San Juan Capistrano, as shown on Exhibit 1.





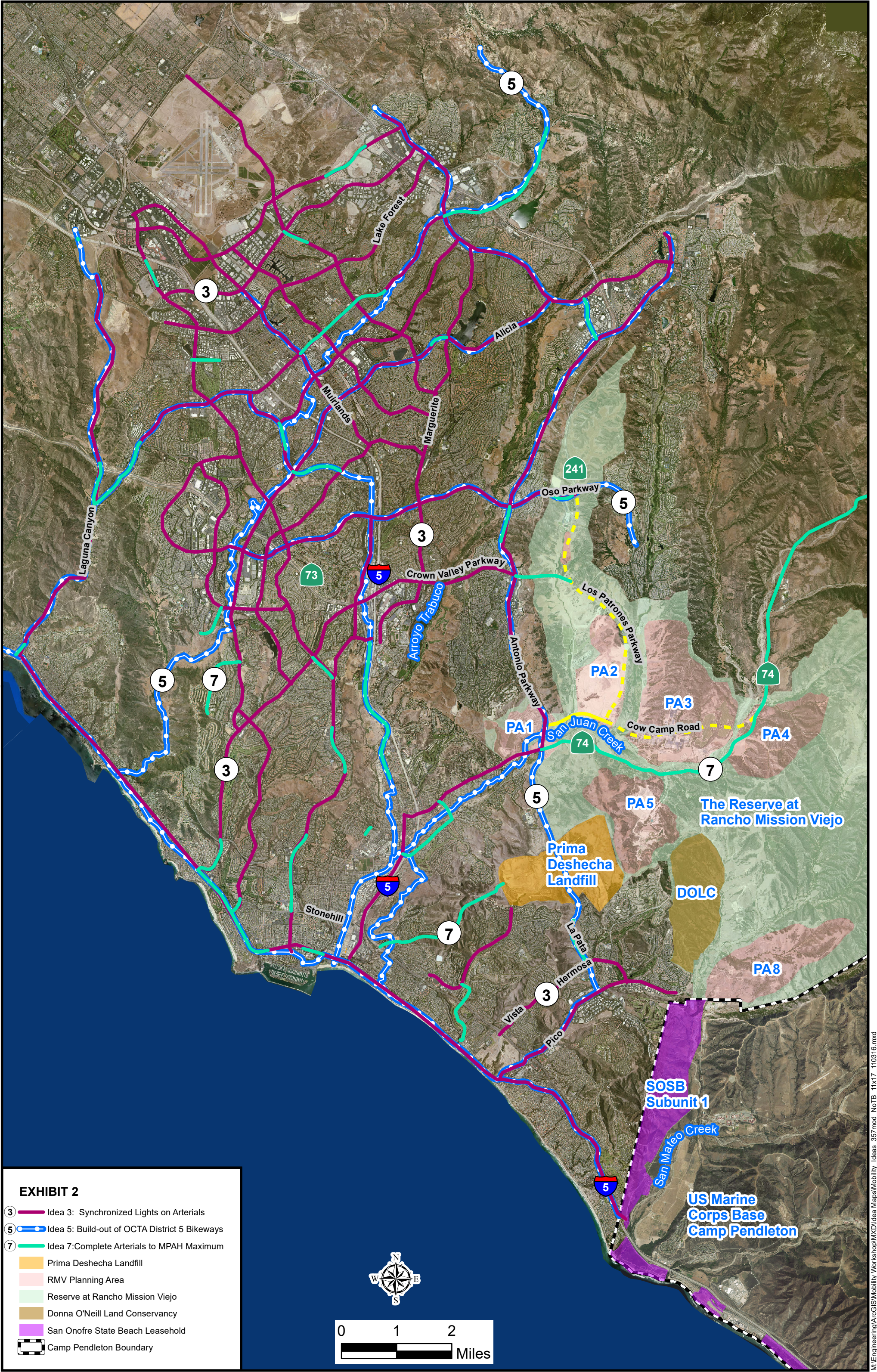
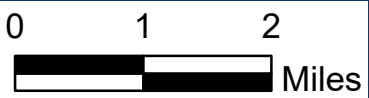


EXHIBIT 2

- ③ Idea 3: Synchronized Lights on Arterials
- ⑤ Idea 5: Build-out of OCTA District 5 Bikeways
- ⑦ Idea 7: Complete Arterials to MPAH Maximum
- Prima Deshecha Landfill
- RMV Planning Area
- Reserve at Rancho Mission Viejo
- Donna O'Neill Land Conservancy
- San Onofre State Beach Leasehold
- Camp Pendleton Boundary



3.7 IDEA 7: COMPLETE ARTERIALS TO MPAH MAXIMUM

Idea 7 would widen segments of the following arterials to be consistent with the Orange County Master Plan of Arterial Highways (MPAH): Alicia Parkway, Alton Parkway, Antonio Parkway, Avenida Empresa, Avenida La Pata, Avenue Vaquero, Camino Capistrano, Camino Las Ramblas, Crown Valley Parkway, Del Obispo Street, El Toro Road, Highlands Avenue, Irvine Center Drive, La Novia Avenue, Niguel Road, Ortega Highway, Oso Parkway, Paseo de Valencia, Pacific Coast Highway, Ridge Route Drive, San Juan Creek Road, State Route 133 (SR-133)/Broadway Street, SR-133/Laguna Canyon Road, Street of the Golden Lantern, Trabuco Road, and Wood Canyon Drive, as shown on Exhibit 2.

3.8 IDEA 8: EXTEND LA PATA AVENUE TO CRISTIANITOS ROAD

This idea proposes extending La Pata Avenue to Cristianitos Road on Marine Corps Base Camp Pendleton in San Diego County, as shown on Exhibit 1.

3.9 IDEA 9: CONNECT ORTEGA HIGHWAY AND ANTONIO PARKWAY TO AVERY PARKWAY AND SR-73

Idea 9 proposes connecting Ortega Highway and Antonio Parkway to a new highway, which would connect to Avery Parkway and State Route 73 (SR-73), as shown on Exhibit 1.

3.10 IDEA 10: ADD I-5 HIGH-OCCUPANCY VEHICLE LANES FROM AVENIDA PICO TO THE SAN DIEGO COUNTY LINE

This idea proposes the extension of the high-occupancy vehicle (HOV) lane on I-5 in each direction between Avenida Pico and the Orange County/San Diego County line, as shown on Exhibit 1.

3.11 IDEA 11: ADD I-5 GENERAL-PURPOSE LANES FROM I-405 TO THE SAN DIEGO COUNTY LINE

This idea proposes the addition of one general-purpose lane on I-5 in each direction between San Diego County and I-405, as shown on Exhibit 1.

3.12 IDEA 12: ADD I-5 HIGH-OCCUPANCY/TOLL LANE FROM I-405 TO THE SAN DIEGO COUNTY LINE

Idea 12 proposes the addition of one high-occupancy/toll (HOT) lane on I-5 in each direction between San Diego County and I-405, as shown on Exhibit 1.

3.13 IDEA 13: CONNECT SR-241 TO I-5 VIA WESTERN ALIGNMENT (LOCAL CONNECTION AT LA NOVIA AVENUE)

This idea proposes connecting existing State Route 241 (SR-241) to I-5 at La Novia Avenue, as shown on Exhibit 1. Idea 13 would transition to the existing alignment of I-5 in San Diego County and would end at Basilone Road.

3.14 IDEA 14: CONNECT SR-241 TO I-5 VIA LA PATA AVENUE CROSSING (LOCAL CONNECTION AT AVENIDA PICO)

Idea 14 proposes connecting existing SR-241 to I-5 along La Pata Avenue at Avenida Pico, as shown on Exhibit 1. Idea 14 would transition to the existing alignment of I-5 in San Diego County and would end at Basilone Road.

3.15 IDEA 15: CONNECT SR-241 TO I-5 VIA CRISTIANITOS ROAD

This idea proposes connecting existing SR-241 to I-5 at Cristianitos Road, as shown on Exhibit 1. Idea 15 is TCA's previously selected preferred alignment, known as the Green Alignment, which was rejected by the California Coastal Commission and United States Secretary of Commerce in 2008.

3.16 IDEA 16: ASSUME 20 PERCENT OF VEHICLE FLEET IS AUTOMATED

Idea 16 assumes that 20 percent of the vehicles on roadways in south Orange County would be autonomous (i.e., self-driving vehicles).

3.17 IDEA 17: CONNECT SR-241 TO I-5 VIA SHORE CLIFFS (LOCAL CONNECTION AT AVENIDA VAQUERO)

This idea proposes connecting existing SR-241 to I-5 at Avenida Vaquero, as shown on Exhibit 1. Idea 17 would transition to the existing alignment of I-5 in San Diego County and would end at Basilone Road.

3.18 IDEA 18: CONNECT SR-241 TO SR-73, AND EXTEND CROWN VALLEY PARKWAY TO SR-241

Idea 18 proposes a combination of Idea 9 (without a connection to Ortega Highway) as well as a new extension of Crown Valley Parkway to existing SR-241, as shown on Exhibit 1.

3.19 IDEA 19: CONNECT SR-241 TO I-15 IN TEMECULA

This idea proposes a 32-mile extension of SR-241 through the Santa Ana Mountains and the Cleveland National Forest, connecting to Interstate 15 (I-15) near Temecula.

3.20 IDEA 20: DOUBLE DECKING I-5

This idea proposes an elevated four-lane median viaduct on I-5 from the Orange County/San Diego County line to the I-405/I-5 interchange.

4.0 EVALUATION

Due to the wide spectrum of improvements, the ideas were initially sorted into the following categories:

- **Category 1:** Ideas that are already being advanced or implemented by agencies other than TCA
- **Category 2:** Ideas that are ineffective or are premature
- **Category 3:** Ideas that are not feasible due to regulatory or financial constraints
- **Category 4:** Remaining ideas subjected to mobility analysis

4.1 CATEGORY 1: IDEAS THAT ARE ALREADY BEING ADVANCED OR IMPLEMENTED BY OTHER AGENCIES

- **Idea 6** (Widen Ortega Highway to Four Lanes in San Juan Capistrano) is being led by both the County of Orange and Caltrans and supported by OCTA with Measure M2 funding.
- **Idea 8** (Extend La Pata Avenue to Cristianitos Road) is being advanced by the City of San Clemente via a preliminary engineering study.
- **Idea 10** (Add I-5 HOV Lanes from Avenida Pico to the San Diego County Line) is being advanced by OCTA through initiation of a Project Study Report/Project Development Support (PSR/PDS).

4.2 CATEGORY 2: IDEAS THAT ARE INEFFECTIVE OR PREMATURE

- **Idea 1** (Dynamic Pricing of TCA Facilities) involves charging toll rates in response to congestion. This idea would only provide a nominal reduction in vehicle hours of delay (VHD) on I-5 and no benefit to arterial highways.
- **Idea 16** (Assume 20 Percent of Vehicle Fleet is Automated) has the potential to improve mobility on I-5, but the implementation of this idea is beyond the horizon of this initial screening due to evolving technology, the need for government regulation, and uncertain public support.

4.3 CATEGORY 3: IDEAS THAT ARE INFEASIBLE DUE TO REGULATORY OR FINANCIAL CONSTRAINTS

- **Idea 2** (Greater Train Frequency) was previously evaluated by OCTA, the Federal Railroad Administration, and Metrolink and was found to either have unacceptable community impacts or was financially not feasible.
- **Idea 15** (Connect SR-241 to I-5 via Cristianitos Road) is the Green Alignment that was selected as the Preferred Alternative for the South Orange County Transportation Infrastructure Improvement Project (SOCTIIP). In 2008, the California Coastal Commission denied a Coastal Consistency Permit for this alignment. The U.S. Secretary of Commerce denied TCA's appeal of the California Coastal Commission's decision. Because this idea cannot be permitted, it is infeasible.

- **Idea 19** (Connect SR-241 to I-15 in Temecula) does not address the I-5 (north-south) mobility problem, and there are regulatory constraints associated with the Cleveland National Forest.
- **Idea 20** (Double Decking I-5) is similar in function and performance to Idea 12 but at a substantially higher cost (approximately 3 times). In addition, this idea would cost approximately \$6 billion to \$7 billion to construct, which is substantially higher than the Category 4 ideas.

4.4 CATEGORY 4: REMAINING IDEAS SUBJECTED TO MOBILITY ANALYSIS

The remaining ideas (listed below) fall into this category. Ideas 3, 5, and 7 are part of existing programs, but TCA could assist in further advancing these ideas.

- Idea 3 (Synchronized Lights on Arterials)
- Idea 4 (Mobility hubs at Train Stations and other Key Locations)
- Idea 5 (Build Out of OCTA District 5 bike facilities)
- Idea 7 (Complete Arterials to MPAH Maximum)
- Idea 9 (Connect Ortega Highway and Antonio Parkway to Avery Parkway and SR-73)
- Idea 11 (Add I-5 General-Purpose Lanes from I-405 to the San Diego County Line)
- Idea 12 (Add I-5 HOT Lanes from I-405 to the San Diego County Line)
- Idea 13 (Connect SR-241 to I-5 via Western Alignment [Local Connection at La Novia Avenue])
- Idea 14 (Connect SR-241 to I-5 via La Pata Avenue Crossing)
- Idea 17 (Connect SR-241 to I-5 via Shore Cliffs [Local Connection at Avenida Vaquero])
- Idea 18 (Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241)

4.5 TRAFFIC EVALUATION METHODOLOGY

Based on the identified north-south mobility problem, the following three mobility metrics were developed for the traffic evaluation analysis:

- Weekday VHD on the I-5 corridor (between Oso Parkway and the County line)
- Weekday VHD on the following major east-west arterials that provide connections with I-5 in south Orange County:
 - Oso Parkway between Moulton Parkway and SR-241
 - Crown Valley Parkway between Moulton Parkway and Antonio Parkway
 - Ortega Highway between Camino Capistrano and Antonio Parkway
 - Vista Hermosa between Avenida Pico and La Pata Avenue
 - Avenida Pico between El Camino Real and La Pata Avenue
 - New east-west arterial connection between Avery Parkway and Antonio Parkway (only applicable to Ideas 9 and 18)
- Congested vehicle miles of travel on weekdays in south Orange County

Congestion reduction was measured in terms of the change in daily VHD on weekdays for the I-5 corridor and the list of arterial highways described above. Delay represents the extra time motorists spend on the road because they are travelling at less than the free-flow speed due to congestion.

On I-5, motorists often encounter greater delay on weekends (Saturday southbound and Sunday northbound); however, a predictive tool has not been created (by OCTA or Caltrans) to forecast future weekend conditions or test the benefits of ideas. In the next phase of project development (PSR/PDS Phase), TCA intends to collect additional weekend data and create a means to further compare Category 4 ideas.

Congested vehicle miles traveled (VMT) is another indicator of a driver's experience on the system. Congested VMT represents the distance traveled by motorists in conditions of substantial congestion (when the demand exceeds the capacity). Like VHD, this was measured only for weekdays during this phase of the evaluation.

The Orange County Transportation Analysis Model (OCTAM) was used to evaluate the VHD and congested VMT for a majority of the ideas. Ideas 3, 4, and 5 relate to program-level or nonmotorized improvements, and the OCTAM, like many regional models, is not designed to this level of detail; therefore, the VHD and congested VMT evaluation for these three ideas was conducted using a qualitative approach based on professional judgement, local knowledge, and experience from similar projects.

The eight ideas analyzed using OCTAM were based on the TRANPLAN version 3.4.1 (which was the most current traffic model available at the time the evaluation commenced) with the "constrained" network that contains the committed infrastructure improvements identified in OCTA's Long Range Transportation Plan. The OCTAM TRANPLAN model with constrained network has been used since the beginning of the South Orange County Mobility Study in 2015; therefore, the same model was used to maintain consistency. A new version (4.0) of the OCTAM TransCAD model will be used for preparation of the Traffic Engineering Performance Assessment during the PSR/PDS phase.

The OCTAM was used to develop the baseline conditions (Year 2045), and then each of the 11 ideas was coded separately into the OCTAM to evaluate the changes in congested VHD and VMT. The evaluation of the ideas using the OCTAM is based on the same Year 2045 development conditions as assumed in the baseline.

4.6 EVALUATION RESULTS

4.6.1 Vehicle Hours of Delay on I-5

The VHD was evaluated for each of the Category 4 ideas described in Section 4.4 using either the OCTAM or the qualitative approach, and the results shown in Table A reflect Year 2045 daily VHD on the I-5 segment from Oso Parkway to the County line on a typical weekday.

The largest VHD savings on I-5 are expected from four ideas (11, 12, 14, and 17), with delay savings of 4,500 vehicle hours or higher per day. Idea 13 would also result in noticeable delay savings on I-5 of 3,300 hours per day. Each of these ideas involves adding capacity to regional corridors (e.g., I-5 or

Table A: Daily Vehicle Hours of Delay on I-5

Idea	VHD	Change (Compared to Baseline)	VHD Change in % (Compared to Baseline)	Benefit (Rating)
Baseline	12,200	—	—	—
3 Synchronized Lights on Arterials	Qualitative	-50 to -100	—	
4 Mobility Hubs at Train Stations and other Key Locations	Qualitative	-50 to 0	—	
5 Build Out of OCTA District 5 Bike Facilities	Qualitative	-50 to 0	—	
7 Complete Arterials to MPAH Maximum	11,900	-300	-2%	
9 Connect Ortega Highway and Antonio Parkway to Avery Parkway and SR-73	11,500	-700	-6%	
11 Add I-5 General-Purpose Lanes from I-405 to San Diego County Line	7,000	-5,200	-43%	
12 Add I-5 HOT Lanes from I-405 to San Diego County Line	7,300	-4,900	-40%	
13 Connect SR-241 to I-5 via Western Alignment (Local Connection at La Novia Avenue)	8,900	-3,300	-27%	
14 Connect SR-241 to I-5 via La Pata Avenue Crossing (Local Connection at Avenida Pico)	6,600	-5,600	-46%	
17 Connect SR-241 to I-5 via Shore Cliffs (Local Connection at Avenida Vaquero)	7,700	-4,500	-37%	
18 Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241	11,500	-600	-5%	

= 0 to -500
 = -501 to -1,500
 = -1,501 to -3,000
 = -3,001 to -4,500
 = -4,501 to -6,000

HOT = high-occupancy/toll

I-405 = Interstate 405

I-5 = Interstate 5

MPAH = Master Plan of Arterial Highways

OCTA = Orange County Transportation Authority

SR-241 = State Route 241

SR-73 = State Route 73












VHD = vehicle hours of delay






SR-241) via widening or extending the corridors. The arterial capacity improvements (e.g., Ideas 7, 9, and 18) would generate moderate delay savings on I-5. Other program-level and nonmotorized improvements, including Ideas 3, 4, and 5, would result in minimal delay savings to the I-5 corridor.

4.6.2 Vehicle Hours of Delay on the Arterial Highway System

Table B shows Year 2045 daily VHD on the arterial highway system (including east-west major arterials in South County).

Table B: Daily Vehicle Hours of Delay on Arterial Highway System

Idea	VHD	Change (Compared to Baseline)	VHD Change in % (Compared to Baseline)	Benefit (Rating)
Baseline	3,400	—	—	
3 Synchronized Lights on Arterials	Qualitative	-30 to -10	—	
4 Mobility Hubs at Train Stations and other Key Locations	Qualitative	-10 to 0	—	
5 Build Out of OCTA District 5 Bike Facilities	Qualitative	-10 to 0	—	
7 Complete Arterials to MPAH Maximum	3,800	+400	12%	
9 Connect Ortega Highway and Antonio Parkway to Avery Parkway and SR-73	2,300	-1,100	-32%	
11 Add I-5 General-Purpose Lanes from I-405 to San Diego County Line	3,500	+100	3%	
12 Add I-5 HOT Lanes from I-405 to San Diego County Line	3,360	-40	-1%	
13 Connect SR-241 to I-5 via Western Alignment (Local Connection at La Novia Avenue)	3,100	-300	-9%	
14 Connect SR-241 to I-5 via La Pata Avenue Crossing (Local Connection at Avenida Pico)	3,300	-100	-3%	
17 Connect SR-241 to I-5 via Shore Cliffs (Local Connection at Avenida Vaquero)	3,200	-200	-6%	
18 Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241	2,370	-1,040	-31%	

 = +500 to -50
  = -51 to -100
  = -101 to -500
  = -501 to -1,000
  = -1,001 to -1,500

HOT = high-occupancy/toll

I-405 = Interstate 405

I-5 = Interstate 5

MPAH = Master Plan of Arterial Highways

OCTA = Orange County Transportation Authority

SR-241 = State Route 241

SR-73 = State Route 73

VHD = vehicle hours of delay

With the proposed addition to enhance east-west connectivity, Ideas 9 and 18 would result in greater VHD savings on the arterial highway system (more than 1,000 vehicle hours per day). Ideas 13, 14, and 17 would also result in moderate delay savings on arterials (more than 100 vehicle hours) due to the direct connection between SR-241 and I-5, which would transfer less volume to the arterials between SR-241 and I-5. Ideas 7 and 11 would result in moderate increased delay on arterials because more traffic would use the east-west arterials to connect with I-5. Other program-level and nonmotorized improvement ideas (Ideas 3, 4, and 5) would result in very minimal delay savings to the arterial highway system.

4.6.3 Congested Vehicle Miles Traveled in South Orange County

Similar to VHD, the ideas involving adding capacity to the roadway network via widening and extending regional corridors would result in the highest congestion relief and least congested VMT.

As shown in Table C, where Year 2045 daily congested VMT for each idea are included, Ideas 11, 12, 13, 14, and 17, which enhance I-5 or SR-241, would result in the most reduction in congested VMT (21 percent or higher). The arterial capacity improvements (Ideas 7, 9, and 18) would generate moderate reduction in congested VMT. Other program-level and nonmotorized improvements (Ideas 3, 4, and 5) would result in minimal reduction in congested VMT in south Orange County.

Table C: Daily Congested Vehicle Miles Traveled in South County

Idea	Congested VMT	Change in % (Compared to Baseline)	Benefit (Rating)
Baseline	2,142,400	—	
3 Synchronized Lights on Arterials	Qualitative	-5% to -1%	
4 Mobility Hubs at Train Stations and other Key Locations	Qualitative	-1% to 0	
5 Build Out of OCTA District 5 Bike Facilities	Qualitative	-1% to 0	
7 Complete Arterials to MPAH Maximum	2,014,400	-6%	
9 Connect Ortega Highway and Antonio Parkway to Avery Parkway and SR-73	2,055,300	-4%	
11 Add I-5 General-Purpose Lanes from I-405 to San Diego County Line	1,497,300	-30%	
12 Add I-5 HOT Lanes from I-405 to San Diego County Line	1,703,000	-21%	
13 Connect SR 241 to I-5 via Western Alignment (Local Connection at La Novia Avenue)	1,669,800	-22%	
14 Connect SR 241 to I-5 via La Pata Avenue Crossing (Local Connection at Avenida Pico)	1,484,400	-31%	
17 Connect SR 241 to I-5 via Shore Cliffs (Local Connection at Avenida Vaquero)	1,577,100	-26%	
18 Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241	2,014,600	-6%	

= 0 to -5%
 = -6% to -10%
 = -11% to -20%
 = -21% to -29%
 = -30% to -40%

HOT = high-occupancy/toll

I-405 = Interstate 405

I-5 = Interstate 5

MPAH = Master Plan of Arterial Highways

OCTA = Orange County Transportation Authority

SR-241 = State Route 241

SR-73 = State Route 73

VMT = vehicle miles traveled

5.0 RECOMMENDATIONS

1. Based on the results of the evaluation methodology, ideas in Category 4 that provide substantial benefits in reducing delay on I-5 or the arterial highway system are recommended to be advanced to the PSR/PDS Phase. This includes the following ideas:
 - **Idea 9:** Connect Ortega Highway and Antonio Park way to Avery Parkway and SR-73
 - **Idea 11:** Add I-5 General-Purpose Lanes from I-405 to San Diego County Line
 - **Idea 12:** Add I-5 HOT Lanes from I-405 to San Diego County Line
 - **Idea 13:** Connect SR-241 to I-5 via the Western Alignment (Local Connection at La Novia Avenue)
 - **Idea 14:** Connect SR-241 to I-5 via La Pata Avenue Crossing (Local Connection at Avenida Pico)
 - **Idea 17:** Connect SR-241 to I-5 via Shore Cliffs (Local Connection at Avenida Vaquero)
 - **Idea 18:** Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241
2. The remaining ideas in Category 4 are under the jurisdiction of local agencies (cities) or the county. It is proposed that TCA discuss these ideas with the local agencies of jurisdiction and offer to provide assistance to increase the state of readiness for funding applications and preliminary engineering to interested agencies. Those ideas are:
 - **Idea 3:** Synchronized Lights on Arterials
 - **Idea 4:** Mobility hubs at Train Stations and other Key Locations
 - **Idea 5:** Build Out of OCTA District 5 bike facilities
 - **Idea 7:** Complete Arterials to MPAH Maximum
3. Ideas in Categories 2 and 3 are not recommended for further consideration due to lack of effectiveness, control, regulatory constraints, or financial feasibility.

The following chart (Exhibit 3) illustrates the recommended disposition of all 20 ideas for purposes of advancement to the PSR/PDS Phase.

Category 1 - Already Being Advanced or Implemented

- Idea 6.** Widen Ortega Highway to Four Lanes in San Juan Capistrano
- Idea 8.** Extend La Pata Ave to Cristianitos Road
- Idea 10.** Add I-5 HOV Lanes from Avenida Pico to County Line

Category 2 - Ineffective or Premature



- Idea 1.** Dynamic Pricing of TCA Facilities
- Idea 16.** Assume 20% of Vehicle Fleet is Automated

Category 3 - Infeasible due to Regulatory or Financial Constraints

- Idea 2.** Greater Train Frequency
- Idea 15.** Connect SR-241 to I-5 via Cristianitos Road
- Idea 19.** Connect SR-241 to I-15 in Temecula
- Idea 20.** Double Decking I-5

Category 4 - Mobility Benefits/Further Study Needed

- Idea 3.** Synchronized Lights on Arterials
- Idea 4.** Add Mobility Hubs at Train Stations and other Key Locations
- Idea 5.** Build Out of OCTA District 5 Bike Facilities
- Idea 7.** Complete Arterials to MPAH Maximum
- Idea 9.** Connect Ortega Highway and Antonio Parkway to Avery Parkway and SR 73
- Idea 11.** Add I-5 General Purpose Lanes from I-405 to County Line
- Idea 12.** Add I-5 HOT Lanes from I-405 to County Line
- Idea 13.** Connect SR-241 to I-5 via Western Alignment (La Novia Avenue)
- Idea 14.** Connect SR-241 to I-5 via La Pata Avenue Crossing
- Idea 17.** Connect SR-241 to I-5 via Shore Cliffs (Avenida Vacquero)
- Idea 18.** Connect SR-241 to SR-73 and Extend Crown Valley Parkway to SR-241

-  - TCA offer assistance to local jurisdictions
-  - Ideas advanced to PSR/PDS phase